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Australalacarus (Acari: Halacaridae) from northern Australia, with the description of three new species

J.C. Otto

Australian Institute of Marine Science, P.M.B. 3, Townsville MC, Queensland 4810, Australia
e-mail j.otto@aims.gov.au

Abstract – The Great Barrier Reef and Coral Sea are inhabited by at least four species of *Australalacarus* Bartsch, namely *A. pustulatus* Bartsch and three new species that are described here, *A. longipalpus* sp. nov., *A. mesaktanus* sp. nov. and *A. zagorskisae* sp. nov. *Australalacarus pustulatus* is also recorded from the northwestern Australian Montebello Islands. Its larva, the first one known for *Australalacarus*, is described and compared with that of other halacarid taxa. A key to *Australalacarus* species is presented and Australalacarinae subfam. nov. is proposed to accommodate *Australalacarus* and *Colobocerasides* Viets.

INTRODUCTION

Halacaridae, 0.15–2 mm long aquatic mites that occur in marine as well as freshwater habitats, have reached astonishing diversity. Approximately 1000 species have been described but many more are likely to exist. The present paper is part of a series of publications dealing with the halacarids found during a three year survey of the Great Barrier Reef and Coral Sea. Among the species collected are four *Australalacarus* species, three of these new to science.

Two species of *Australalacarus* were previously known: *A. inexpectatus* Bartsch, 1987, from the Chilean Magellan Strait, and *A. pustulatus* Bartsch, 1993, from Rottnest Island in southwestern Australia. In contrast to most other halacarid genera the cuticle of *Australalacarus* species is mostly membranous rather than sclerotised and the rostrum is sharply pointed rather than blunt. Their body is conspicuously elongate and filled with dark brown matter and the legs are attached at the extreme anterior and posterior ends, giving the whole animal a rather sausage-like appearance. Bartsch (1987, 1993) speculated that at least some of these characters may be correlated with a suspected parasitic mode of life. However, feeding has not been observed and a predatory or even algivorous lifestyle cannot be ruled out.

MATERIALS AND METHODS

All mites were extracted from sediment samples by vigorously stirring the sediment in a bowl of water and decanting the supernatant through a 100 µm sieve. All specimens were cleared in lactic acid and mounted in PVA. Drawings were made from compressed slide-mounted specimens. Specimens with a QMS accession number are deposited in the Queensland Museum (QM), at the branch Museum of Tropical Queensland in Townsville. Abbreviations for other repositories are: ANIC, Australian National Insect Collection; WAM, Western Australian Museum, Perth; ZMH, Zoologisches Institut und Zoologisches Museum der Universität Hamburg.

Abbreviations used in text and figures: AD, anterior dorsal plate; AE, anterior epimeral plate; d-pas, doubled parambulacral seta(e); ds-3, ds-5, third and fifth pair of dorsal setae, respectively, counted from anterior; GA, genitoanal plate; gb, gnathosomal base; OC, ocular plate; pas, parambulacral seta(e); PD, posterior dorsal plate; PE, posterior epimeral plate; pgs, perigenital seta(e); P-1, P-2, P-3, first, second and third palp segments, respectively, counted from base of palp; sgs, subgenital seta(e); ro, rostrum; I-IV, leg I to leg IV; ω, solenidion on leg tarsi I and II.

SYSTEMATICS

Australalacarinae subfam. nov.

Type Genus
Australalacarus Bartsch, 1987.

Diagnosis
Idiosoma with two pairs of OC (Figure 1A). Six pairs of dorsal idiosomal setae, the anterior-most on the AD, the posterior-most on anal cone; remaining four pairs either all in membranous cuticle, or three pairs in membranous cuticle and one on PD. 2–4 pairs of platelets ventrally between AE and GA (Figure 1C). Female GA usually with 2–3 pairs of pgs, but no sgs. Rostrum stylet-shaped (Figure 2E); two pairs of maxillary setae, one inserted about half way along gnathosomal base, the other immediately

posterior to rostrum (Figure 2F). Palps separated by a distance that is not greater than the width of one proximal palp segment; with three or four segments. P-2 with one seta, apical palp segment with three basal setae. In species with four palp segments P-3 without a seta. Pharyngeal plate wider than half the width of gnathosomal base.

Remarks

Australacarinae subfam. nov is here proposed to accommodate *Australacarus* Bartsch, 1987, and *Colobocerasides* Viets, 1950 (see Bartsch, 1998a). The latter genus currently consists of two species, *C. koehleri* (Trouessart, 1896) from the northeastern Atlantic (gulf of Gascogne, 1410 m depth), and *C. auster* Bartsch, 1998, from the Western Antarctic (61°18.7'–61°17.4'S, 56°33.3'–56°30.5'W, 460–480 m depth).

Both genera are similar in several conspicuous and, for halacarids, unusual characters, most importantly two pairs of OC, a stylet-shaped rostrum, a series of ventral plates in the membranous cuticle between AE and GA, and a large pharyngeal plate. Other similarities, not quite as conspicuous but nevertheless rare in halacarids, include a single seta on basifemur III and IV and an unusually long solenidion on tarsus I. As it is unlikely that all these characters evolved convergently, a close relationship of *Australacarus* and *Colobocerasides* seems extremely likely. The Halacarinae to which they have previously been assigned (Bartsch, 1987) is a heterogenous group which is not defined by any characters that are likely to be synapomorphic. Its function has mostly been to accommodate those genera that cannot be assigned to other better defined subfamilies and this has resulted in a rather unnatural assemblage. This problem needs eventually to be addressed comprehensively and the Halacarinae, as well as other halacarid subfamilies, needs to be redefined; however, this would involve a thorough cladistic analysis that is beyond the scope of the current project. Meanwhile, the reassignment of genera such as *Australacarus* and *Colobocerasides*, which are clearly not closely related to *Halacarus*, to better defined subfamilies appears a small though beneficial step towards achieving a more natural system of halacarid subfamily classification.

Genus *Australacarus* Bartsch

Australacarus Bartsch, 1987:17; Bartsch 1993: 65; Bartsch 1998a: 231.

Type Species

Australacarus inexpectatus Bartsch, 1987, by monotypy and original designation.

Diagnosis

Body in non-compressed specimens greatly elongate, sausage-like, filled with a dark brown substance; four pairs of minute dorsal setae in membranous cuticle (Figure 1A); pair of setae ds-3 further apart than any other pairs of dorsal idiosomal setae. PE and AE at the extreme anterior and posterior ends of idiosoma, widely separated from each other (Figure 1C). PD greatly reduced, smaller than AD. Three pairs of platelets ventrally between AE and PE, the anterior-most wider than the others. AE with three pairs of setae, PE each with three setae. Palp three- or four- segmented. Trochanter III with one seta. Solenidion on tarsus I similar in length and thickness to dorsal setae on that segment (Figure 3A).

Remarks

Australacarus can be distinguished from *Colobocerasides* by the morphology of PD and PE. In *Australacarus* the PD is shorter than the AD and lacks setae, and the entire PE lies in the posterior 1/3 of the idiosoma. In *Colobocerasides* the PD is longer than the AD and has a pair of setae anteriorly, and the PE extends well into the anterior half of the idiosoma. *Australacarus* is known only from the southern hemisphere.

Australacarus longipalpus sp. nov.

Figures 1–3

Material Examined

Holotype

♀, QMS105551, ca. 17°25'S 151°40'E, Coral Sea, Lihou Reef, 22 July 1998, D. Fenner, sand at 7 m.

Paratypes

Australia: Queensland: 1 ♂, QMS105552, 1 ♀ (ZMH), 2 deutonymphs, QMS105553/105554, 17°41.157'S 148°33.044'E, Coral Sea, North Flinders Reefs, East Ribbon Reef, 3 July 1999, J.C. Otto, coarse sand at 10 m.

Description

Female

Holotype idiosoma 444 µm long, other specimen distorted. Membranous cuticle covered with numerous papillae (Figure 2C, D). AD, PE and AE finely punctate (Figure 1A–C). Posterior margin of AD convex; pair of gland pores in posterior half (Figure 1B), slightly anterior to pair of setae. Anterior OC (Figures 1A, 2A) more elongate than posterior OC (Figures 1A, 2B) and lacking pore, with series of fine canaliculi. In one specimen OC with large subsurface scar similar to that indicated by dotted line in Figure 2C, D for male, in other specimen no such scar seen. Posterior OC with pore and few scattered canaliculi. PD ca. twice as wide as long and distinctly wider than 1/2 the width of

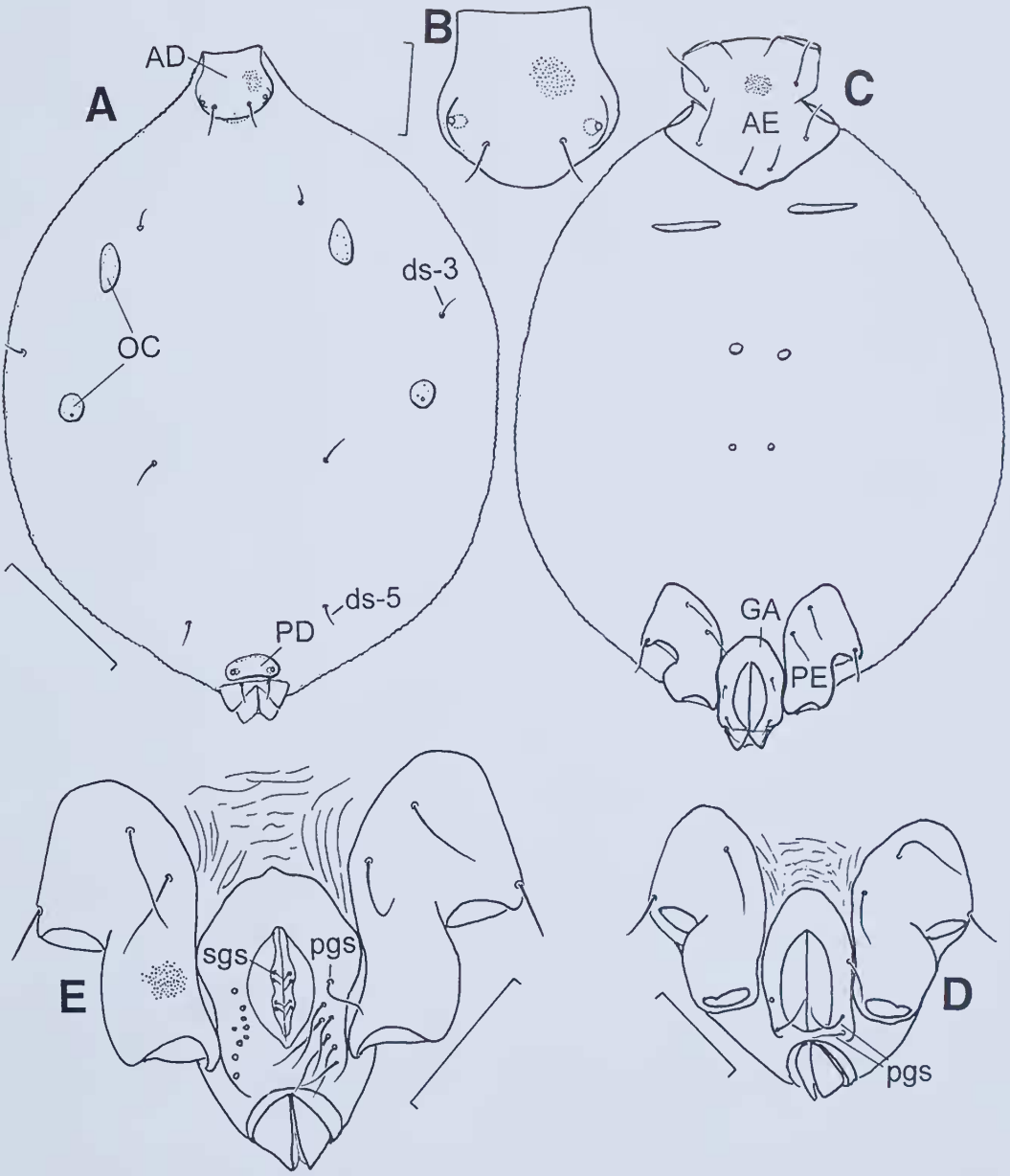

Figure 1 *Australacarus longipalpus* sp. nov., adult. A, idiosoma, dorsal view; B, anterior dorsal plate; C, female idiosoma, ventral view; D, posterior epimeral plates and genitoanal plate of female; E, posterior epimeral plates and genitoanal plate of male. Scale bars: A, C, 100 µm; B, 25 µm; D, E, 50 µm.

anal cone, with pair of gland pores and with a series of canaliculi along anterior margin. Ventral platelets immediately posterior to AE four to five times as wide as long. GA usually with three pairs pgs, in one specimen two pgs on one side and three on the other (Figure 1D)

Gnathosomal base finely punctate (Figure 2E,F). Pattern of pharyngeal plate as in Figure 2F. Palp three-segmented. P-1 and P-2 combined longer than gnathosomal base; P-2 delicately punctate, with small dorsal fissure anterior to seta.

All leg segments finely punctate. Chaetotaxy (trochanter – tibia): I 0-2-4-5-9 (Figure 3A), II 0-2-4-4-6 (Figure 3B), III 1-1-2-3-5 (Figure 3C), IV 1-1-4-4-

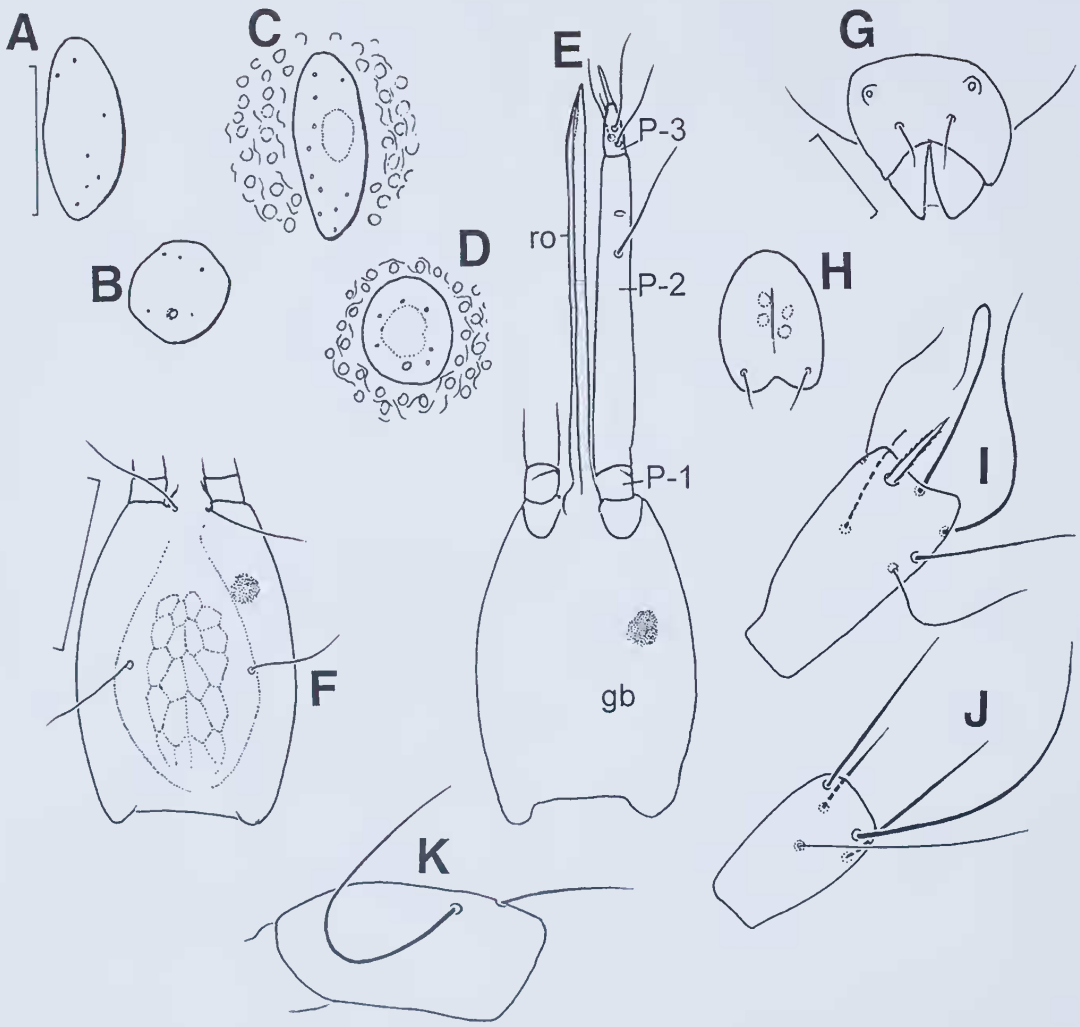

Figure 2 *Australacarus longipalpus* sp. nov. A, anterior ocular plate of female; B, posterior ocular plate of female; C, anterior ocular plate of male; D, posterior ocular plate of male; E, adult gnathosoma, dorsal view; F, adult gnathsomal base, ventral view; G, fused posterior dorsal plate and anal cone of deutonymph; H, genital plate of deutonymph; I, tibia I of deutonymph, ventromedial view; J, tibia II of deutonymph, dorsal view; K, telofemur IV of deutonymph, lateral view. Scale bars: A–D, 25 µm; E, F 50 µm; G–K, 25 µm.

6 (Figure 3D). Tibia I with ventromedial bipectinate seta but pectination sometimes barely visible depending on orientation, other legs without bipectinate setae. Solenidion on tarsus II heavier but shorter than that on tarsus I. Tarsus I with pair of doubled pas and two unpaired ventral setae. Tarsus II with pair of pas singlets and unpaired ventral seta. Tarsi III and IV with pair of pas singlets but without ventral seta. Paired claws of all legs with pecten along most of shaft and with accessory process. Median claw on legs I more clearly visible than those on other legs, including non-exposed part shorter than 1/4 of paired claws, median claws of legs II-IV rudimentary.

Male

Length unknown, specimen distorted. GA with seven pgs on one side of GO and nine pgs on the other side (Figure 1E); four pairs of sgs, two anteriorly, two posteriorly. All other characters as for female.

Deutonymph

Idiosoma 351 µm long. PD fused to anal cone (Figure 2G). GA with one pair pgs (Figure 2H). Tibia I with seven setae (Figure 2I). Tibia II with five setae (Figure 2J). Telofemur IV with two setae (Figure 2K). In all other characters as for female.

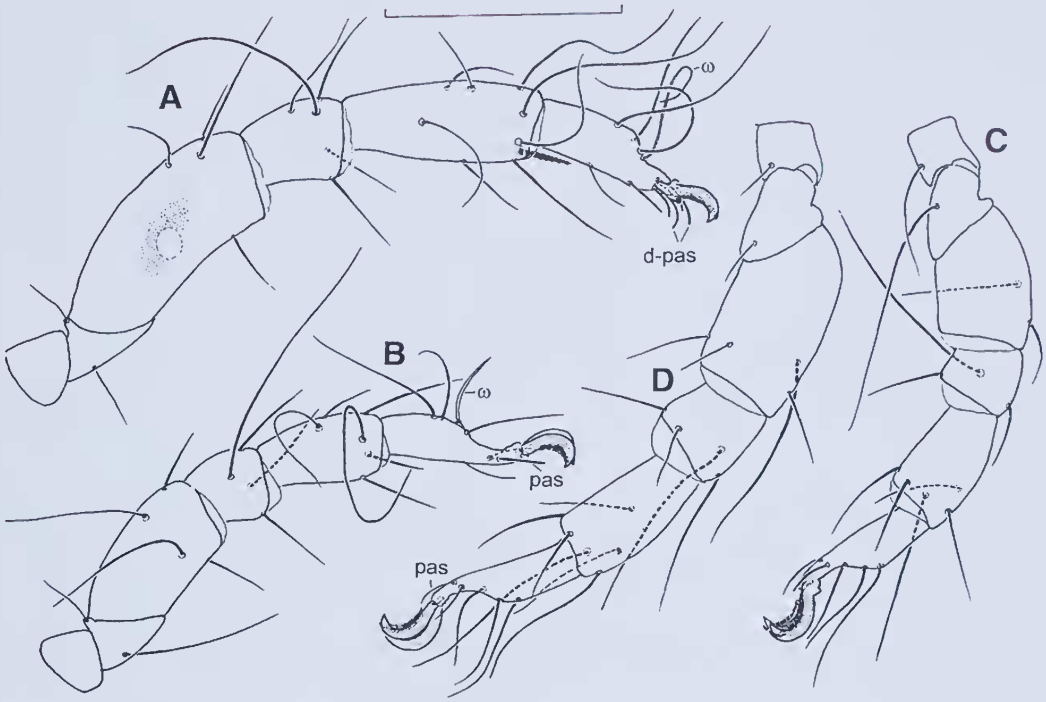

Figure 3 *Australacarus longipalpus* sp. nov., adult. A, leg I, lateral view; B, leg II, lateral view; C, leg III, medial view; D, leg IV, medial view. Scale bar: A–D, 100 µm.

Remarks

The only other known species of *Australacarus* with four setae on telofemur IV is *A. mesaktanus* sp. nov. For differences between both species see the remarks to the latter.

A. longipalpus is known only from the Queensland Plateau. Whether it is absent on the Great Barrier Reef, which is less than 150 km away but separated from the Queensland Plateau by a more than 1000 m deep trough (Orme, 1977) is unclear. However, several species in the halacarid genera *Acaromantis, Arhodeoporus, Copidognathus, Corallihalacarus, Halacarellus, Halacarus, Simognathus, Scaptognathides, Scaptognathus*, and an undescribed genus (Otto, 1999, 2000a, 2000b; Otto, unpublished), are also known only from the Queensland Plateau and a pattern pointing towards a distinct halacarid fauna of the Queensland Plateau is beginning to emerge.

Etymology

The specific epithet refers to the species' relatively long palps.

Australacarus mesaktanus sp. nov.
Figures 4, 5

Material Examined

Holotype

♀, QMS105563, Great Barrier Reef, 23°12.22'S 151°58.49'E, 27 August 1999, I. Zagorskis, coarse sand at 60 m.

Description

Female

Idiosoma 518 µm long. Membranous cuticle between plates papillate (Figure 4G). AD, PE and AE finely punctate. Posterior margin of AD drawn out into a thickened nose-like projection (Figure 4A); pair of gland pores and pair of setae in posterior half, pores slightly anterior to setae and each seta closer to a gland pore than to other seta. Anterior OC (Figure 4C) more elongate than posterior OC (Figure 4D), anterior and posterior OC with several canaliculi and central subcuticular scar or cavity, posterior OC in addition with a pore. PD 14 µm long and 8 µm wide, distinctly narrower than 1/2 of anal cone (Figure 4B), with pair of gland pores and anteriorly with several canaliculi. Pair of ventral platelets immediately posterior to AE three to four times wider than long (Figure 4E). GA with three pairs pgs (Figure 4F).

Gnathosomal base finely punctate. Pattern of pharyngeal plate as in Figure 4H. Palp three-

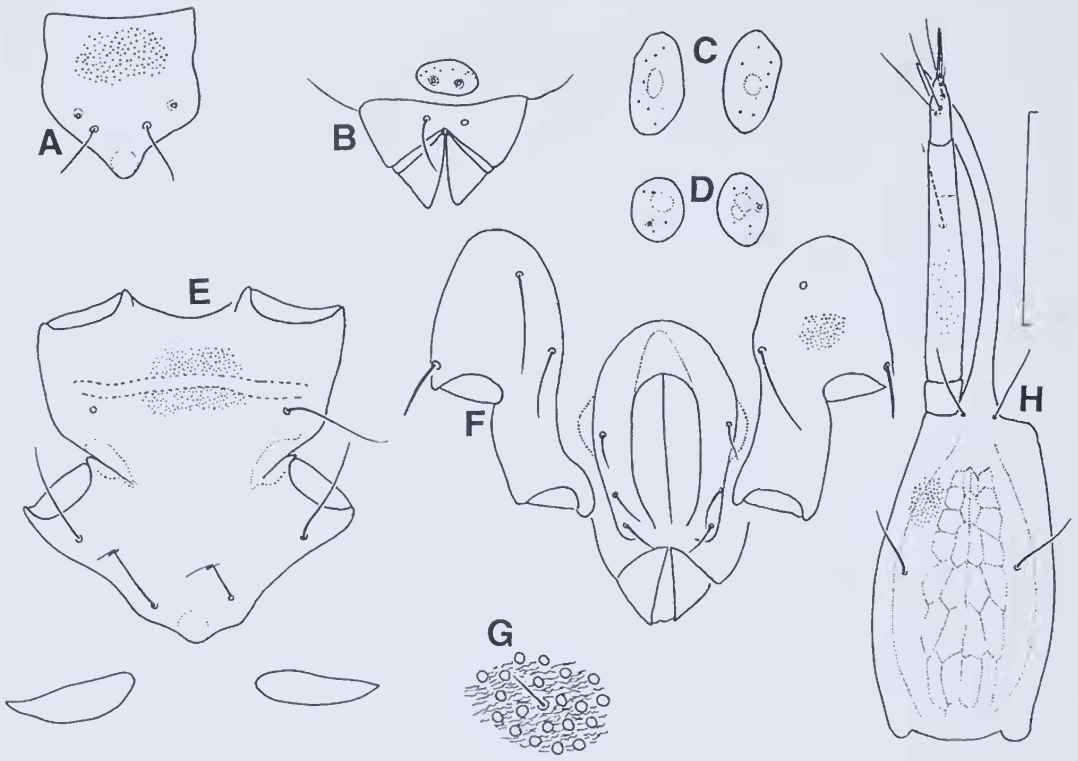

Figure 4 *Australacarus mesaktanus* sp. nov., female. A, anterior dorsal plate; B, posterior dorsal plate and anal cone; C, anterior ocular plates, left and right respectively; D, posterior ocular plates, left and right respectively; E, anterior epimeral plate and ventral platelets; F, posterior epimeral plates and genitoanal plate; G, detail of membranous cuticle surrounding dorsal seta; H, ventral gnathosoma. Scale bar: A–H, 50 µm.

segmented, P-1 and P-2 combined shorter than gnathosomal base; P-2 finely punctate; anterior to insertion of seta with dorsal fissure.

All legs finely punctate. Chaetotaxy (trochanter – tibia): I 0-2-4-5-9 (Figure 5A), II 0-2-4-4-6 (Figure 5B), III 1-1-2-3-5 (Figure 5C), IV 1-1-4-4-6 (Figure 5D). Tibia I with ventromedial bipectinate seta (oil immersion), other legs without such seta. Solenidion on tarsus II heavier but shorter than that on tarsus I. Tarsus I with pair of doubled pas and two unpaired ventral setae. Tarsus II with pair of pas singlets and unpaired ventral seta. Tarsi III and IV with pair of pas singlets but no ventral seta. Paired claws of all legs with conspicuous accessory process and pecten along most of shaft. Median claw on all legs barely visible.

Male

Unknown.

Remarks

A. mesaktanus is closely related to *A. longipalpus* sp. nov. which also has four setae on telofemur IV, a single bipectinate seta on tibia I and an elongate anterior OC that lacks a pore. *A. mesaktanus* can be distinguished from *A. longipalpus* by the AD having a conspicuous posterior nose-like projection, the PD being narrower than 1/2 the width of the anal cone and P-1 and P-2 combined being shorter than the gnathosomal base.

Etymology

mesaktos [Gr.] = in mid ocean; referring to the species' occurrence in relatively deep water.

Australacarus zagorskisae sp. nov.

Figures 6, 7

Material Examined

Holotype

♂, QMS105564, Great Barrier Reef, 23°12.22'S 151°58.49'E, 27 August 1999, I. Zagorskis, coarse sand at 60 m.

Description

Male

Idiosoma 531 µm long. Membranous cuticle between plates with numerous papillae (as for *A.*

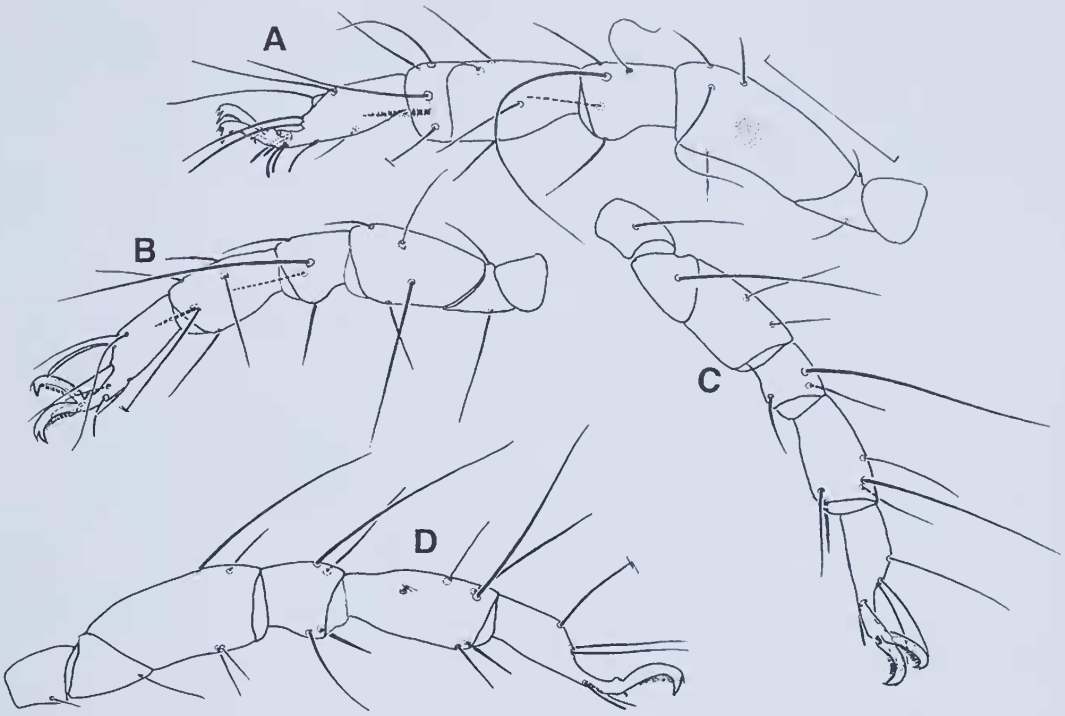

Figure 5 *Australacarus mesaktanus* sp. nov., female. A, leg I, lateral view; B, leg II, dorsolateral view; C, leg III, ventrolateral view; D, leg IV, lateral view. Scale bar: A–D, 50 µm.

mesaktanus in Figure 4G). AD punctate except for a transverse area anteriorly (Figure 6A). Posterior margin of AD convex, gland pores distinctly anterior of setae; distance between setae less than that between seta and gland pore. Anterior OC variable in shape within the single specimen (Figure 6B), slightly longer than wide, with central pore and numerous canaliculi, of which five or six are more conspicuous than others. Posterior OC (Figure 6C) with small pore and scattered canaliculi of which one or two are more conspicuous than others. PD slightly wider than long (Figure 6D), with few canaliculi, mostly in anterior half. AE covered with numerous canaliculi, those in a transverse anterior band finer than others; a gap anterior to insertions of legs I (arrow in Figure 6E) that exposes an epimeral pore. Platelets immediately posterior to AE minute, not distinctly wider than long. GA finely punctate, with 10 pgs on one side and 12 pgs on the other and four pairs of sgs.

Gnathosomal base finely punctate with pattern of pharyngeal plate as in Figure 6G. Palp three-segmented. Segment P-2 shorter than gnathosomal base; with a narrow furrow surrounding the entire segment anteriorly; canaliculi proximal to furrow coarser than those distal to it.

All legs finely punctate. Chaetotaxy (trochanter – tibia): I 0-2-4-5-10 (Figure 7A), II 0-2-4-4-6 (Figure 7B), III 1-1-2-3-5 (Figure 7C), IV 1-1-2-4-7 (Figure 7D). Tibia I with two bipectinate setae (oil immersion). Solenidion on tarsus II heavier but shorter than that on tarsus I. Tarsus I with pair of doubled pas and two unpaired ventral setae. Tarsi II-IV with pair of pas singlets but no ventral seta. Paired claws of all legs with conspicuous accessory process, pecten along most of shaft on legs II-IV, no pecten seen on claws of leg I. Median claw of all legs minute, scarcely protruding.

Female

Unknown.

Remarks

A. zagorskisae is similar to *A. inexpectatus* and *A. pustulatus* in having two setae on telofemur IV and a pore on the anterior OC. It differs from *A. inexpectatus* by lacking a conspicuous posterior protrusion on the AD, having a three- rather than four -segmented palp, two instead of three ventral setae on tarsus I, and 22 instead of ca. 50 pgs in the male. Differences are also present in leg chaetotaxy, according to Bartsch's (1987) illustrations *A.*

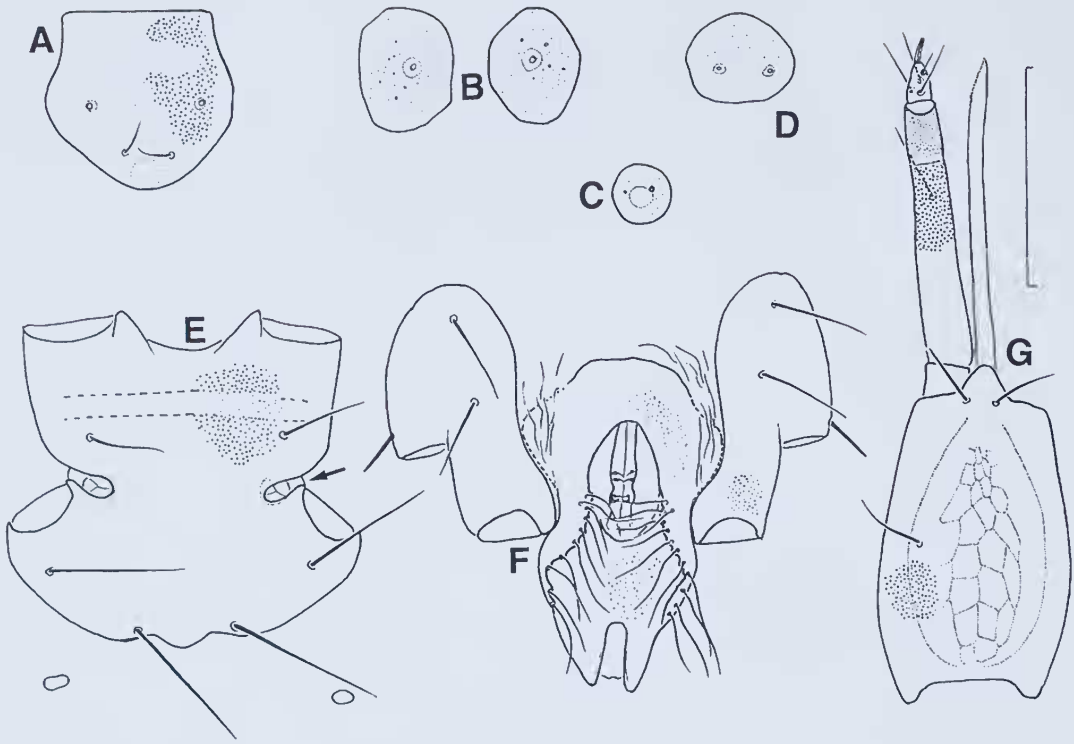

Figure 6 *Australacarus zagorskisae* sp. nov., male. A, anterior dorsal plate; B, anterior ocular plates, left and right respectively; C, posterior ocular plate; D, posterior dorsal plate; E, anterior epimeral plate; F, posterior epimeral plates and genitoanal plate; G, gnathosoma, ventral view. Scale bar: A–G, 50 µm.

inexpectatus possesses 13 setae on tibia I, 11 setae on tibia II, and nine setae on tibia IV, while in *A. zagorskisae* the respective numbers are ten, six and seven. *A. zagorskisae* can be most easily distinguished from *A. pustulatus* by the lack of a well developed median claw on the legs which is present in the latter species. In addition, *A. zagorskisae* has two instead of three ventral setae on tarsus I, and on genu IV and tibiae I, II, and IV it has one more seta than *A. pustulatus*.

Etymology

In honour of Irena Zagorskis.

Australacarus pustulatus Bartsch

Figures 8, 9

Australacarus pustulatus Bartsch, 1993: 65.

Material Examined

Australia: Queensland: 1 ♀, QMS105555, 14°18'S 145°12'E, Great Barrier Reef, Sand Bank No. 1, lagoon, 21 Oct. 1998, P. Tomkins, coarse sand at 3–4 m; 1 ♂, QMS105557, 1 ♀, QMS105558, 18°16.46'S 147°22.88'E, Great Barrier Reef, Myrmidon Reef, 13 Apr. 1998, J. C. Otto, coarse sand and rubble at 7 m; 1 ♂, QMS105559, 19°20.12'S 149°02.85'E, Great Barrier Reef, Elizabeth Reef, 25 Dec. 1997, J. C. Otto, coarse sand at 3 m; deutonymph, QMS105560, 18°24.87'S 142°20.785'E, Great Barrier Reef, Faraday Reef, 12 Apr. 1998, J. C. Otto, fine sand at 12–15 m; larva, QMS105561, ca. 19°07'S 152°16'E, Coral Sea, Marion Reef, 9 Jul. 1998, D. Fenner, sand at 6 m; 1 ♂, 14°19.5'S 144°57.5'E, Great Barrier Reef, Reef 14-056, 21 Oct. 1998 P. Tomkins, medium coarse sand (ZMH). Western Australia: ♀ holotype (WAM), Phillip Rock, coarse sediment, rich on debris from seagrasses, 8 m depth, 21 Jan. 1991; 1 ♀, QMS105556, 1 ♀ (WAM), 1 ♂ (WAM), 20.603514°S 115.6129°E, near Montebello Islands, Harriet Alpha Platform, 31 Dec. 1998, S. Codi, coarse sand at 20 m.

Description

Larva

Idiosoma 252 µm long. AD with pair of gland pores and pair of setae, both posteriorly at same level; posterior margin convex (Figure 8A). Both pairs of OC more or less round, the anterior pair much larger than the posterior one and with a conspicuous pore. PD and anal cone fused (Figure

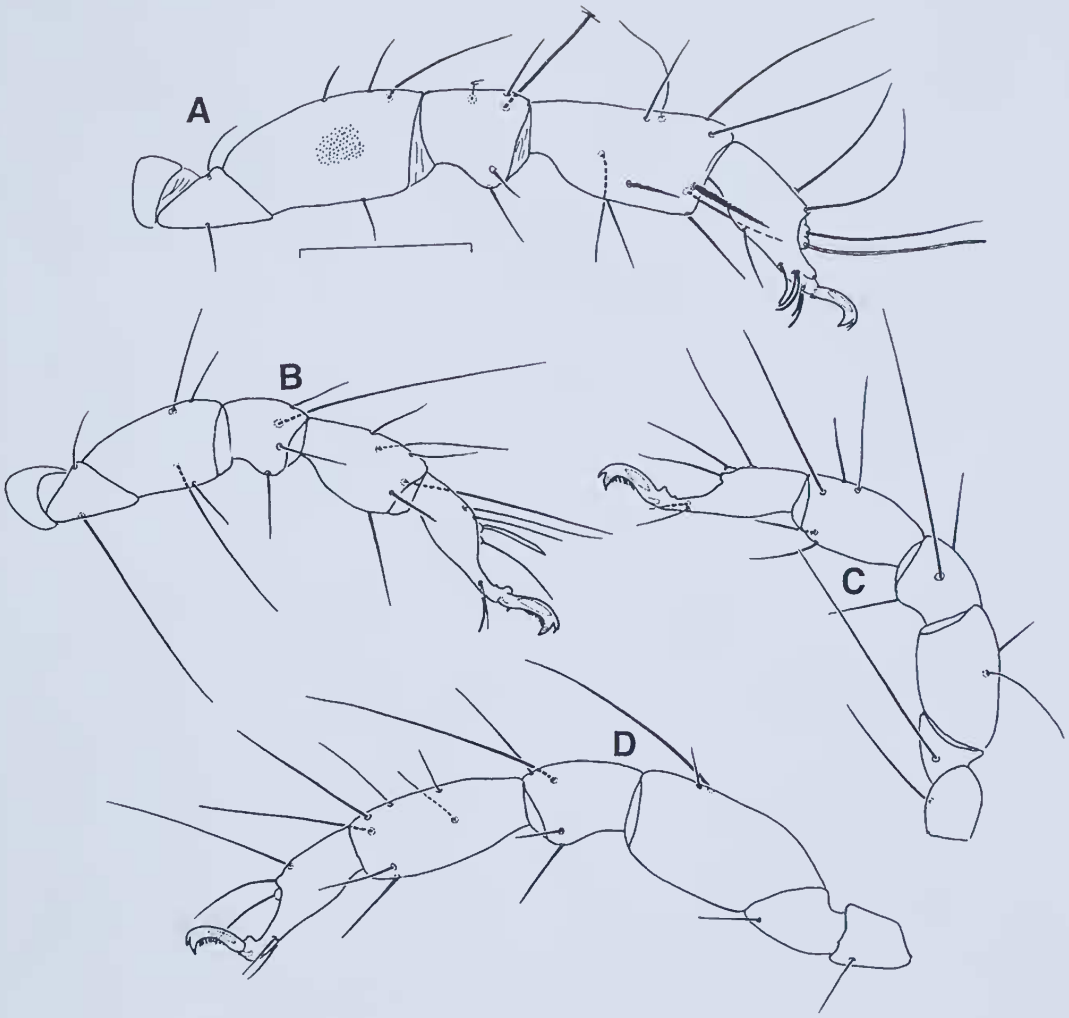

Figure 7 *Australacarus zagorskisae* sp. nov., male. A, leg I, medial view; B, leg II, ventromedial view; C, leg III, ventromedial view; D, leg IV, ventromedial view. Scale bar: A –D, 50 µm.

8C), with two pairs of setae and pair of gland pores. AE with two pairs of setae, PE with one seta. Two pairs of closely associated platelets immediately posterior to AE, two further pairs of platelets more posterior.

Ventral gnathosomal base with two pairs of setae (Figure 8D). Palp three-segmented, P-2 with a well developed dorsal seta (Figure 8E), P-3 with three basal setae and a closely associated pair of spurs apically.

Leg chaetotaxy (trochanter – tibia): I 0-4-4-5 (Figure 9A), II 0-4-4-5 (Figure 9B), III 1-3-3-5 (Figure 9C). Tarsus I with three dorsal setae, three ventral setae and pair of doubled pas. Tarsus II with three dorsal setae, pair of ventral setae and one unpaired lateral pas, tarsus III with three dorsal setae and pair of ventral setae but no pas.

Remarks

The above listed specimens include the first records of *A. pustulatus* from tropical northeastern and northwestern Australia. Rottnest Island in southwestern Western Australia, the only other known location of *A. pustulatus*, is situated much further south at 32°S but is bathed by the warm south-flowing Leeuwin Current, which is known to support a rich tropical fauna (Hutchins and Pearce, 1994). Thus *A. pustulatus* may be a predominantly tropical species. However, further collecting in the southern part of the continent is needed to support this hypothesis.

Most of the characters of the *A. pustulatus* larva and the differences between it and the adult are those usually encountered in halacarids (see Bartsch, 1998b). For example, a genital opening is

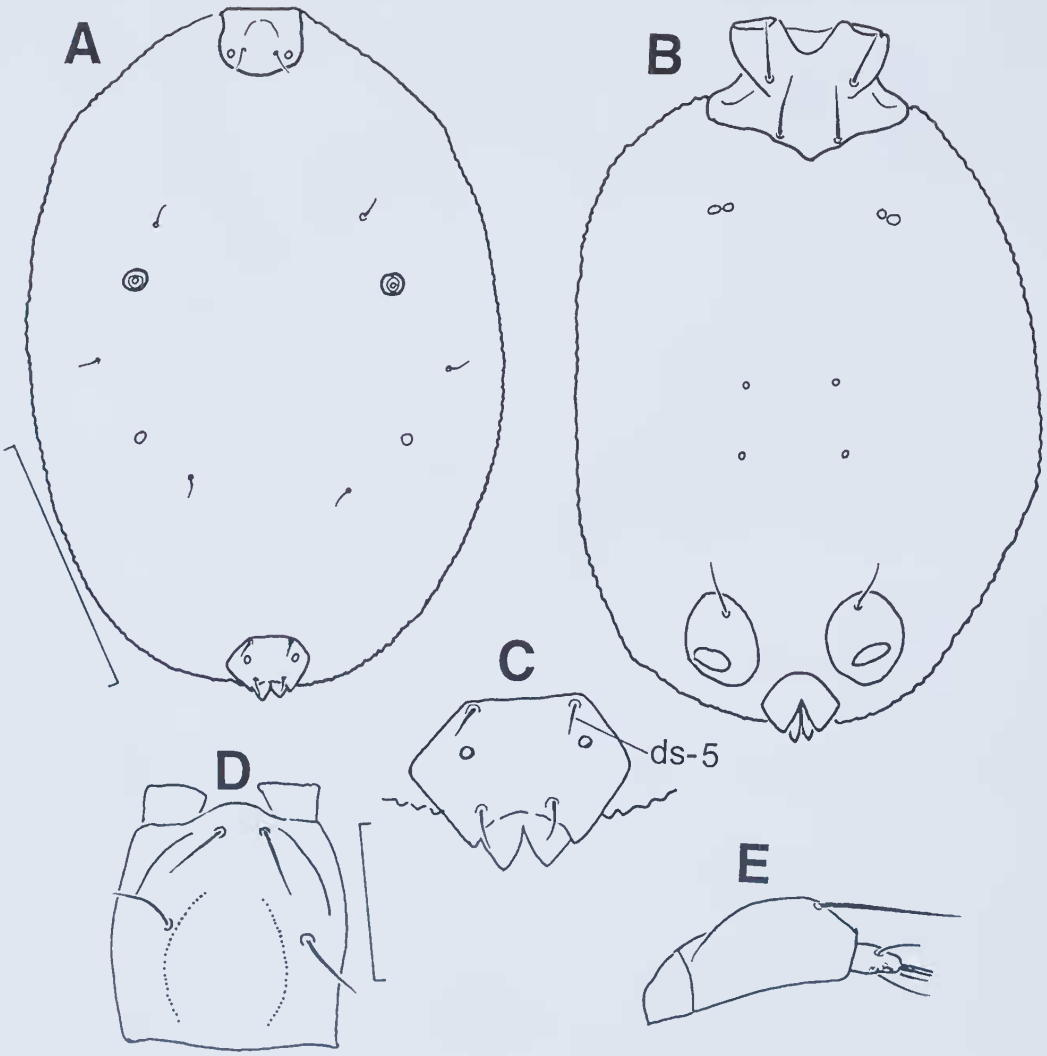

Figure 8 *Australacarus pustulatus* Bartsch, larva. A, idiosoma, dorsal view; B, idiosoma, ventral view; C, posterior dorsal plate and anal cone (fused); D, gnathosomal base, ventral view; E, palp, lateral view. Scale bars: A, B, 100 µm; C–E, 25 µm.

absent, basifemur and telofemur are not yet separated, the dorsal seta corresponding to that on the basifemora of later instar is not yet developed, two instead of three setae are present on the AE, and one instead of three setae are present on the PE. However, unusually for halacarids, in *A. pustulatus* the PD possesses a pair of setae (ds-5) (Figure 8C) that in the later instar moves into the membranous cuticle (Figure 1A). In other halacarids the opposite is usually the case, i. e. the PD increases in relative size and accomodates setae that in the larva are found in the membranous cuticle (Bartsch, 1998b).

Key to species of *Australacarus* (adults)

1. Median claw on all legs ca. 1/2 length of the paired claws (Figure 11 in Bartsch, 1993); tibia II with five setae, genu IV with three setae ..... *A. pustulatus* Bartsch

   Median claw on all legs much shorter than 1/2 of paired claws (Figure 3A–C); tibia II with at least six setae and genu IV with four setae 2

2. Telofemur IV with two setae, anterior OC with pore (Figure 6B); pair of ventral platelets

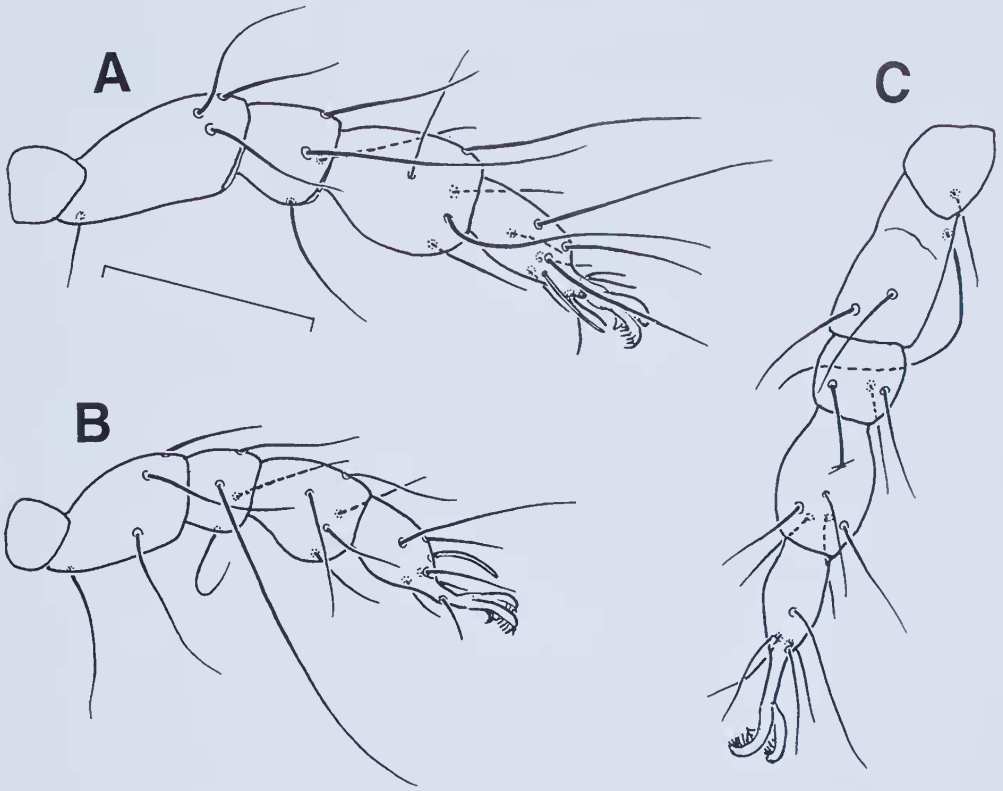

Figure 9 *Australacarus pustulatus* Bartsch, larva. A, leg I, dorsolateral view; B, leg II, dorsolateral view; C, right leg III, dorsal view. Scale bar: A–C, 50 mm.

immediately posterior to AE no wider than twice their length (Figure 6E) 4

Telofemur IV with four setae, anterior OC without pore (Figures 1A, 4C); pair of ventral platelets immediately posterior to AE at least three times wider than long (Figures 1C, 4E) 3

3. Palp segments P-1 and P-2 combined shorter than gnathosomal base (Figure 4H); AD with posterior nose-like projection (Figure 4A); PD narrower than 1/2 the width of anal cone (Figure 4B) ..... *A. mesaktanus* sp. nov.

Palp segments P-1 and P-2 combined longer than gnathosomal base (Figure 2E); posterior margin of AD convex (Figure 1B); PD wider than 1/2 the width of the anal cone (Figure 1A) ..... *A. longipalpus* sp. nov.

4. AD posteriorly drawn out into a pointed protuberance (Figure 4 in Bartsch, 1987); 13 setae on tibia I, 11 setae on tibia II, and nine setae on tibia IV ..... *A. inexpectatus* Bartsch

AD posteriorly convex (Figure 6A); ten setae on tibia I, six setae on tibia II, and seven setae on tibia IV ..... *A. zagorskisae* sp. nov.

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